



Climate Action Progress Report



10/15/2019

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List of Abbreviations

BAU	Business as usual
BEV	Battery electric vehicle
CARIP	Climate Action Revenue Incentive Program
CBEI	Consumption-Based Emissions Inventory
CEEI	Community Energy and Emissions Inventory
CEEP	Community Energy and Emissions Plan
CFB	Canadian Forces Base
DPA	Development Permit Area
EV	Electric vehicle
FCM	Federation of Canadian Municipalities
GHG	Greenhouse gas
ICLEI	International Council for Local Environmental Initiatives
IPCC	International Panel on Climate Change
LCR	Low carbon resilience
OCP	Official Community Plan
PCP	Partners for Climate Protection
RRAP	Residential Retrofit Acceleration Project
tCO₂e	Tonnes CO ₂ equivalents
SRF	Sustainability Reserve Fund
UBCM	Union of BC Municipalities

Introduction

Climate change is already causing serious environmental, social, health, and economic problems and these are projected to become much worse in the coming years. In October 2018, the Intergovernmental Panel on Climate Change (IPCC) released a new report, authored by over 91 scientists from 40 different countries, on the impacts of global heating of 1.5°C above pre-industrial levels. The report highlights a number of climate change impacts that can be avoided by limiting global heating to 1.5°C compared to 2°C or more. The authors state that limiting global heating to 1.5°C requires that emissions of CO₂ need to fall by about 45 per cent by 2030, reaching 'net zero' around 2050. One of the key messages of this report is that while we are already seeing the consequences of a global 1°C rise in temperature, the impacts that would face the planet at a 2°C scenario could be catastrophic.

The success of current emissions reduction efforts is crucial to preventing the worst future scenarios of the climate crisis. Adaptation to these impacts is also essential because global temperatures have already risen and will continue to increase to some extent, even if we were to eliminate all greenhouse gas (GHG) emissions today. We must therefore plan responses to climate change impacts we cannot avoid (adaptation) while reducing emissions to minimize future impacts (mitigation).

Since approximately half of BC's GHG emissions are under the direct or indirect control or influence of municipal governments, the province has recognized that action at the local government level is crucial to meeting its own GHG reduction target of 80 per cent by 2050. The Climate Action Charter is a voluntary agreement between the BC government, Union of BC Municipalities (UBCM) and each local government signatory to take action on climate change. The Charter was launched at the 2007 UBCM Convention and since then, almost every local government in BC has signed. Under the Charter, local government signatories commit to:

- Becoming carbon neutral in their corporate operations
- Measuring and reporting their community's greenhouse gas emissions
- Creating complete, compact, more energy efficient communities

The Township of Esquimalt signed on to the BC Climate Action Charter (Charter) in October of 2008. The Township has also set targets within the Official Community Plan for greenhouse gas reduction. These are outlined in section 13.3 of the OCP as follows:

- Take action to reduce community greenhouse gas (GHG) emissions by at least 38 per cent by 2030, compared to 2007 levels.
- Strive for the ultimate objective of carbon neutrality by realizing zero net community GHG emissions by 2050.

This report documents the progress the Township is making towards these commitments, in particular, progress on reducing greenhouse gas emissions from both the corporation and assisting the community in reducing their own emissions. In addition, it will outline what actions have been taken to date on climate mitigation and climate adaptation and make suggestions for the next steps that the Township might consider to advance climate action in the municipality.

Corporate GHG Emissions Inventory

As a signatory to the BC Climate Action Charter, Esquimalt has committed to becoming carbon neutral in their operations. For the purposes of the Climate Action Charter a local government is considered carbon neutral if it has:

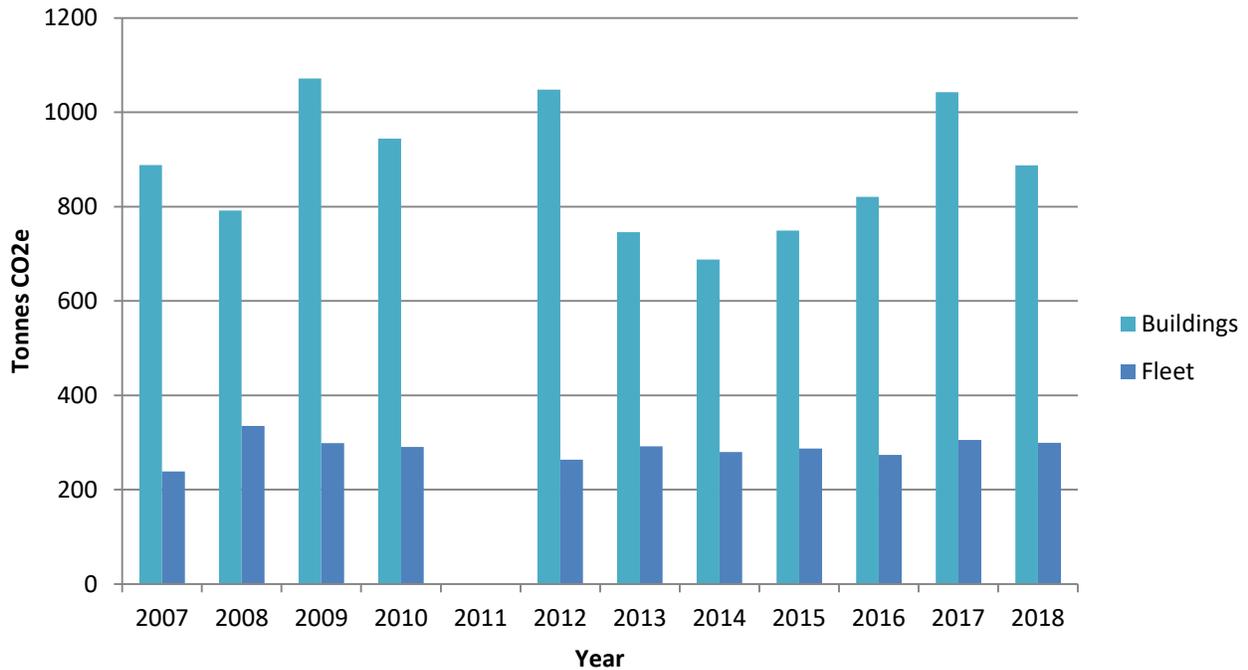
- (1) calculated the total emissions for which it is responsible;
- (2) pursued actions to minimize those emissions;
- (3) balanced and/or offset all remaining emissions; and
- (4) reported publicly on their results.

Staff calculate the Township's GHG emissions annually to prepare the corporate GHG inventory. This inventory is reported each spring, for the preceding year, to Council, the public and to the Province as required under the Climate Charter.

The data for the inventory is obtained primarily from utility billing information and fuel purchases. All local governments use the same methodology. The inventory includes GHGs produced by municipal buildings, infrastructure, fleet and tools and staff travel to conduct business.

Staff have calculated the Township's emissions since 2007. Since 2012, emissions from all sources have been consistently measured and reported on. Figure 1 shows the stationary (buildings and infrastructure) and mobile (fleet) emissions for the corporation since 2007.

Figure 1: Corporate Emissions 2007-2018 (tCO₂e)

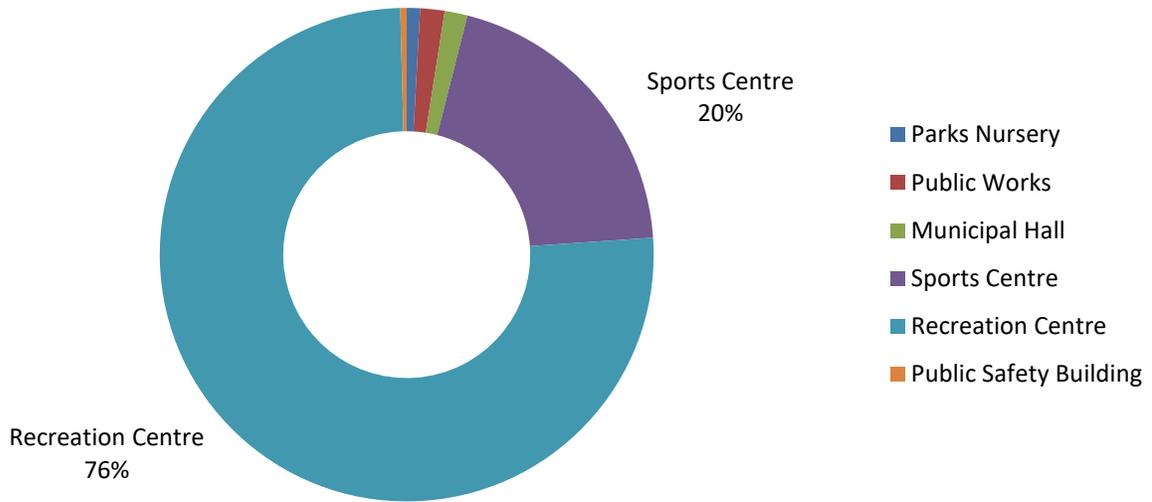


Some of the variability in the earlier years can be accounted for by the introduction of new emissions factors for different fuel types as the climate science became more refined. Corporate emissions have ranged from a high of 1371 tCO₂e (2009) to 968 tCO₂e in 2014. Generally, the proportion of mobile to fleet emissions has stayed fairly consistent with the fleet accounting for about 25 per cent of total emissions and municipal buildings for 75 per cent. Emissions from the fleet have remained very consistent over the last 10 years at around 300 tCO₂e.

With the recreation centre open to the public 17 hours per day, the pool operating system running 24 hours per day, and the sports centre plant running 24 hours a day during the ice season (August-April), it is not surprising that the majority of building emissions are from these facilities (Figure 2).

The building retrofits at the sports centre and the recreation centre had a measurable effect on GHG emissions of about 240 tCO₂e in 2014. However, a system fault with the digital control sensors resulted in an increase in emissions in 2017/2018. In 2019, Council approved funds to remedy the fault. With these resources, staff will be modifying the technology and processes moving forward which should result in the Township seeing significant declines in emissions.

**Figure 2: Corporate Building Emissions 2018
(tCO₂e)**



Some other examples of projects the Township has undertaken to reduce emissions from municipal buildings and fleet are shown in the table on the next page.

Year	Corporate Climate Action
2007	<ul style="list-style-type: none"> • Green Building and Development Policy • Began measuring emissions from Township buildings and fleet
2008	<ul style="list-style-type: none"> • Signed BC Climate Action Charter • Began using biodiesel (5 per cent) in fleet vehicles • Sustainability Reserve Fund established
2010	<ul style="list-style-type: none"> • Energy audits of municipal facilities conducted • Municipal Hall solar hot water installation • Green fleet purchasing plan
2011	<ul style="list-style-type: none"> • Lighting upgrades and sensors installed in some municipal buildings • Recreation Centre solar hot water installation • Energy efficiency retrofit of Archie Browning
2012-2013	<ul style="list-style-type: none"> • Energy efficiency retrofit Esquimalt Recreation Centre
2013	<ul style="list-style-type: none"> • Purchase Nissan Leaf (BEV) for municipal fleet • Install EV charging station
2014	<ul style="list-style-type: none"> • Kitchen scraps collection program
2016-2018	<ul style="list-style-type: none"> • LED streetlight replacement program • Secure staff bicycle parking installed
2019	<ul style="list-style-type: none"> • Joined Partners for Climate Protection • Motion – achieved Milestone 1

Carbon Tax and Sustainability Reserve Fund

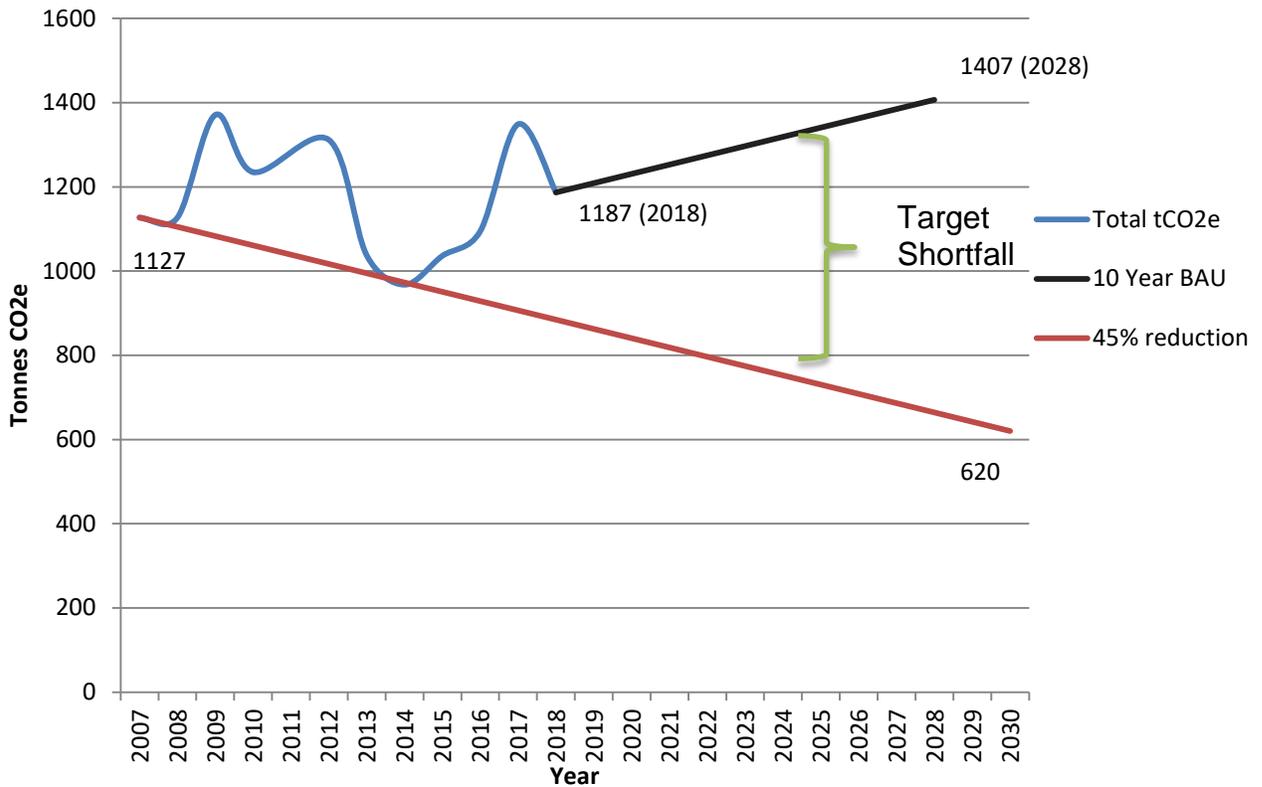
Since 2012, the Township has been participating in the Climate Action Revenue Incentive Program (CARIP). CARIP is a conditional grant program that provides funding to local government Charter signatories in the amount of 100 per cent of the carbon tax that they pay directly. Staff calculate the amount of carbon tax paid for Corporate 'core' business and submit the amount to the province along with a report detailing the actions taken during the reporting year to reduce emissions along with the GHG inventory.

The Township has been depositing the carbon tax refund into the Sustainability Reserve Fund and using this funding for projects primarily related to climate action. Since 2010, about \$287,000 has been allocated from this fund. Some examples of projects funded from this account include the solar hot water initiative, EV charging station, the street light replacement program and new LED lighting for the sports centre and the recreation centre.

Corporate Progress on GHG Reduction

In 2018, the Township’s corporate GHG emissions were 1187 tCO₂e. This is a 9 per cent decrease from the previous year. See Figure 3 for corporate emission trends.

Figure 3: Esquimalt Corporate Emissions 2007-2018 (tCO₂e)



The 10 year business as usual (BAU) trend from 2018 to 2028 is calculated based on existing emissions and the population growth rate of the municipality over the last five years. If Esquimalt continues to grow as it has done most recently, corporate emissions could increase to 1407 tCO₂e. The IPCC recommendation is to reduce emissions (compared to 2010 levels) by 45 per cent; a reduction of over 800 tonnes in the next 10 years.

Community GHG Emissions Inventory

The community GHG inventory has been provided for the Township (and all other BC municipalities) by the province using the Community Energy and Emissions Inventory (CEEI) methodology. CEEI reports have been produced for 2007, 2010 and 2012, but have not been updated more recently.

The community GHG inventory is an estimate of the GHG emissions from all of the activities within the municipality as a whole. The community inventory includes direct emissions such as combustion of fossil fuels for heating buildings, as well as transboundary emission sources generated by community activities. For example, on-road transportation was calculated using fuel consumption and vehicle kilometres travelled data for vehicles registered within the Township's boundaries, although some of this travel is obviously outside Esquimalt. The Township's solid waste figures were estimated on a per capita basis from CRD solid waste data.

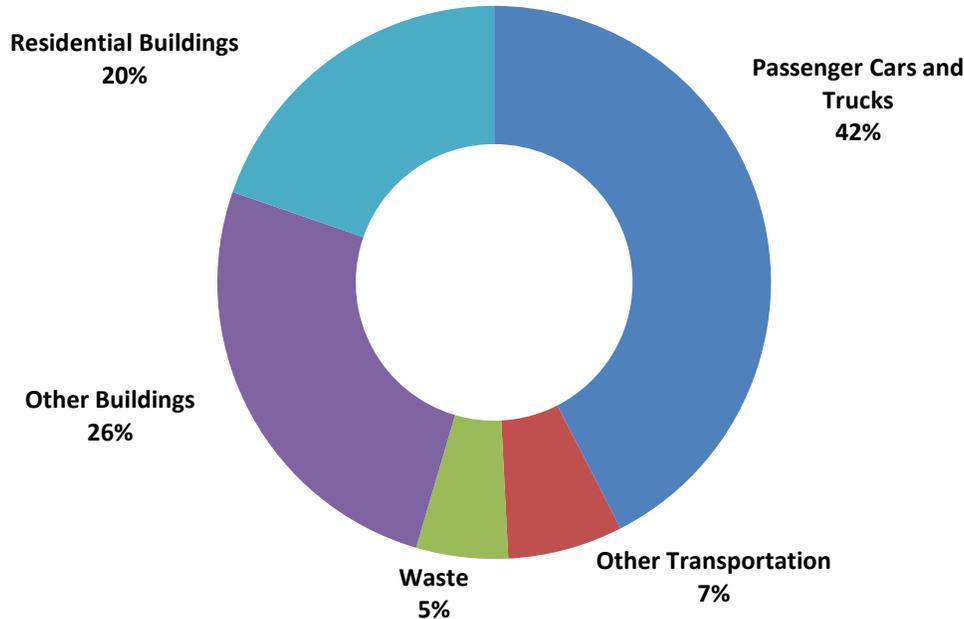
CEEI reports are organized around four primary sectors: buildings, on-road transportation, municipal solid waste, and land-use change from deforestation. Reports for 2007 and 2010 were full reports, which included the on-road transportation emission. In 2012 however, the Province withheld the transportation data for communities outside the lower mainland. This is due to the limited data available to determine the number of vehicle kilometres travelled in these jurisdictions.

The Esquimalt CEEI includes emissions from the Canadian Forces Base (CFB) buildings as these are within the Esquimalt municipal boundary. The CEEI would not however, include transportation by workers from outside the municipality to work at CFB, as these would be accounted for in their municipality of registration.

The CEEI does not include emissions from the products we consume, like our food and clothing and other items which are imported from outside the Township's boundaries. This kind of inventory is called Consumption Based GHG Emissions Inventory (CBEI) and it measures the GHG emissions from all of the goods and services that the community consumes, regardless of where those goods and services are produced. Many cities are now interested in incorporating consumption based emissions as part of their GHG inventory.

The Township's community emissions profile in 2012 showed that transportation accounts for about 49 per cent of the emissions and buildings produce about 46 per cent of the total (see Figure 4). Waste accounted for about 5 per cent of the total). This profile is typical of many other urban municipalities. The total number of GHGs from all three sources was 74,083 tCO₂e.

Figure 4: Community Emissions 2012 (tCO₂e)



Community GHG emissions targets and progress

In May 2010 Council adopted bylaw amendments to the OCP to include targets for reducing community greenhouse gas emissions by at least 38 per cent by 2020; and 83 per cent by 2050 compared to 2007 levels. In the 2018 OCP, the 2020 deadline for 38 per cent reduction was extended to 2030 and a new target of carbon neutrality by 2050 was added. Since that time, Council, along with several other BC municipalities, has declared a Climate Emergency which resolves that “the Township of Esquimalt collaborate with the Capital Regional District and other local governments to work towards achieving carbon neutrality within the region by 2030.”

Due to the lack of updated information from the province via CEEI, it is extremely difficult to determine whether Esquimalt as a community has seen any reduction in GHG emissions. One of the first priorities for climate planning for the community should involve an update of the existing inventory.

The Township has taken a number of actions over the last decade to reduce GHGs in the community. These are outlined in the table below.

Year	Community Climate Action
2008	<ul style="list-style-type: none"> • Signed BC Climate Action Charter
2010	<ul style="list-style-type: none"> • Set first targets for community wide GHG reduction
2011	<ul style="list-style-type: none"> • Green building checklist • Signed onto BC Solar Ready Regulation • Completed “Framework for Community Engagement in Climate Action for the Township of Esquimalt” by RRU students
2012	<ul style="list-style-type: none"> • Completed Craigflower Rd. and Esquimalt Rd. upgrades for active transportation
2013	<ul style="list-style-type: none"> • Installed level 2 public EV charging station at municipal hall • Draft Community Energy and Emissions Plan completed
2014	<ul style="list-style-type: none"> • Implemented organics diversion (municipal pick-up of residential kitchen scraps)
2015	<ul style="list-style-type: none"> • Admirals Rd. corridor upgrade including active transportation infrastructure
2017	<ul style="list-style-type: none"> • Oil to heat pump conversion program top-ups • Cool it workshops in local classrooms • Sidewalk upgrade plan (revised annually)
2018	<ul style="list-style-type: none"> • New Environment, Energy and Climate Change Development Permit Area in OCP • New Climate Neutral target by 2050 in OCP
2018	<ul style="list-style-type: none"> • Started Residential Retrofit Acceleration Program – 2 year program
2019	<ul style="list-style-type: none"> • Joined Partners for Climate Protection – achieved Milestone 2 • Declared Climate Emergency and Climate Neutral by 2030 target. • Council motion to embed Climate Action Plan and Adaptation Plan within the Strategic Plan for 2019-2023

Partners for climate protection

The Township joined the Partners for Climate Protection (PCP) program in February 2019. This program is jointly administrated by the Federation of Canadian Municipalities (FCM) and ICLEI-Local Governments for Sustainability (formerly the International Council for Local Environmental Initiatives). The program assists municipalities to take action against climate change by following a five milestone framework (see Figure 5).

Figure 5

PCP's Five-Milestone Framework



The milestones can be achieved for both corporate operations and community actions. The Township has already achieved the first milestone for its corporate climate action by having a GHG inventory and forecast.

On the community side, milestone 2 has been achieved by having not only an inventory and forecast but an emissions reduction target as well. Staff propose to achieve the third milestone for both corporate and community categories in 2020 by setting a corporate target and developing a climate action plan. Work could also begin on milestone 4; implementing the plan in 2020/2021.

Adaptation planning

Despite global mitigation efforts, it is now acknowledged that we are experiencing and will continue to experience climate change impacts. Climate adaptation is necessary in order to plan for impacts that can be anticipated. A proactive approach to planning for climate impacts is prudent from both a financial (avoided cost) perspective as well as social and environmental perspectives.

Taking no action is always an option, but will not increase the resilience of the Township to withstand the effects of climate change. The climate trends in Canada depict a steady rise in both seasonal and annual temperatures, altered precipitation patterns, and an increase in the frequency, intensity, and duration of extreme weather. For B.C. these changes generally mean hotter, drier summers, more frequent and intense heat waves, more frequent and intense rainfall events, increased wind and storms, and sea level rise.

In the spring of 2018, the Township joined a partnership with ICLEI Canada and eight communities from Vancouver Island in the Together for Climate Project to develop climate change adaptation plans. Each participating municipality will have a community-wide adaptation strategy that includes actionable elements for all participating stakeholders. The purpose of a climate adaptation plan is to mainstream adaptation actions into Township operations and to reduce the risks climate change poses to a community's physical, economic, social, and ecological systems. This involves:

- Identifying locally relevant climate change impacts
- Completing organizational vulnerability and risk assessments
- Establishing long-term adaptation vision and goals
- Identifying relevant adaptation actions
- Developing implementation action plans

Figure 6 shows the Together for Climate Project timeline. The first workshop was held in the fall of 2018 and had 14 participants from both the Township and community organizations and businesses. At this workshop, participants heard about the projected changes in local climate for the next 50-100 years. They were then asked to brainstorm a list of what impacts these changes could have on three sectors: built environment, natural systems and human/social systems.

The team came up with a list of 40 potential impacts to the municipality based on their knowledge and experience. Staff from ICLEI and the Township refined the list further by combining similar impacts and eliminating impacts over which the Township and its residents have little ability to influence. This process resulted in a list of 26 potential impacts from climate change.

Figure 6



At the vulnerability and risk assessment workshop held in February 2019, the team used the refined list of 26 impacts to develop a vulnerability assessment for the Township. Vulnerability, or the degree to which a system is susceptible to the impacts of climate change, is a function of both sensitivity and adaptive capacity. Sensitivity is defined as the degree to which a system is affected by climatic conditions (e.g., temperature increases) or a specific climate change impact (e.g., increased flooding). Adaptive capacity is defined as the ability of built, natural and social systems to adjust to climate change.

Project members reconvened in October 2019 for the process of brainstorming actions to address these vulnerabilities and prioritize them. This work is still ongoing.

Conclusion

The IPCC has consistently warned that without a large decrease in carbon pollution globally, there will be dire consequences both for humanity and the ecosystems within which we live and on which we depend.

Cutting carbon emissions by the amounts recommended will require us to make deep and rapid changes to the way we use energy. Fossil fuels will ultimately need to be replaced through significant improvements in energy efficiency and a rapid shift to renewable energy and other zero emission energy sources. Projects to capture and store carbon from the atmosphere will also be required.

In addition to reducing emissions (mitigation), all organizations will need to prepare for the anticipated impacts of climate change (adaptation).

Esquimalt Council, along with 12 other municipalities in the CRD has declared a climate emergency. Within this declaration, Council resolved to collaborate with the CRD and others to work towards achieving carbon neutrality within the region by 2030. In addition, they resolved to implement a climate action plan and climate adaptation plan as quickly as possible. Terms of Reference for a Climate Action Planning Project will be presented to Council for direction.